

Global strategy of Nissan Production Way Oppama Challenge Updates

February 28th, 2008

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Global strategy of Nissan Production Way

Oppama Challenge

- ✓ Accomplishment
- ✓ Activities

Globalization

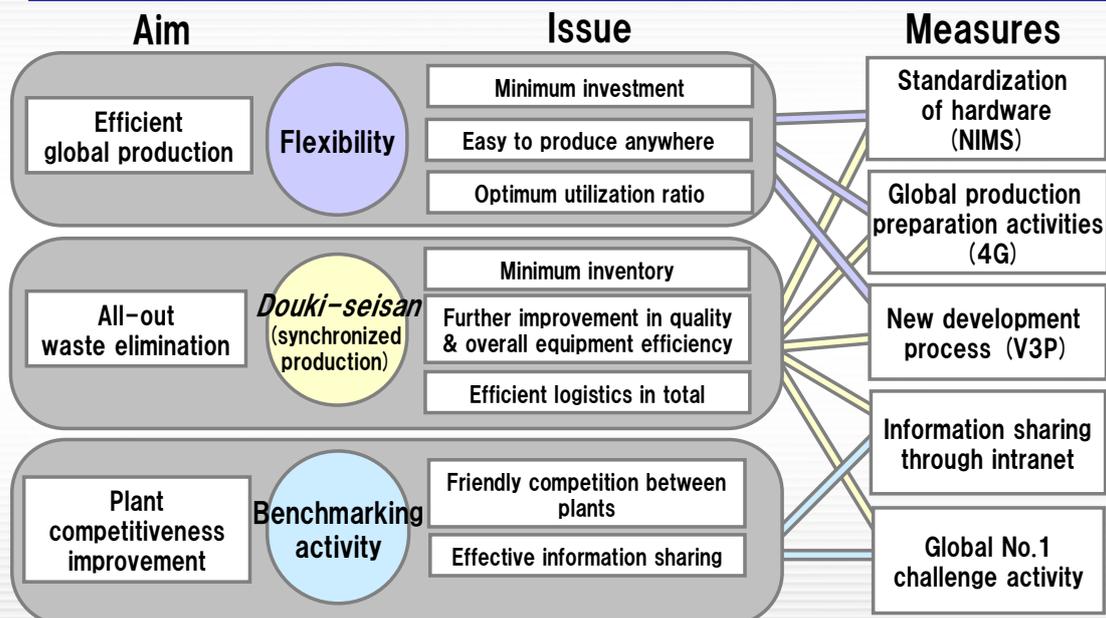
Geographic expansion (Russia, India, Morocco, etc.)



Vehicle assembly plant (incl. KD) : 26
Powertrain plant : 25

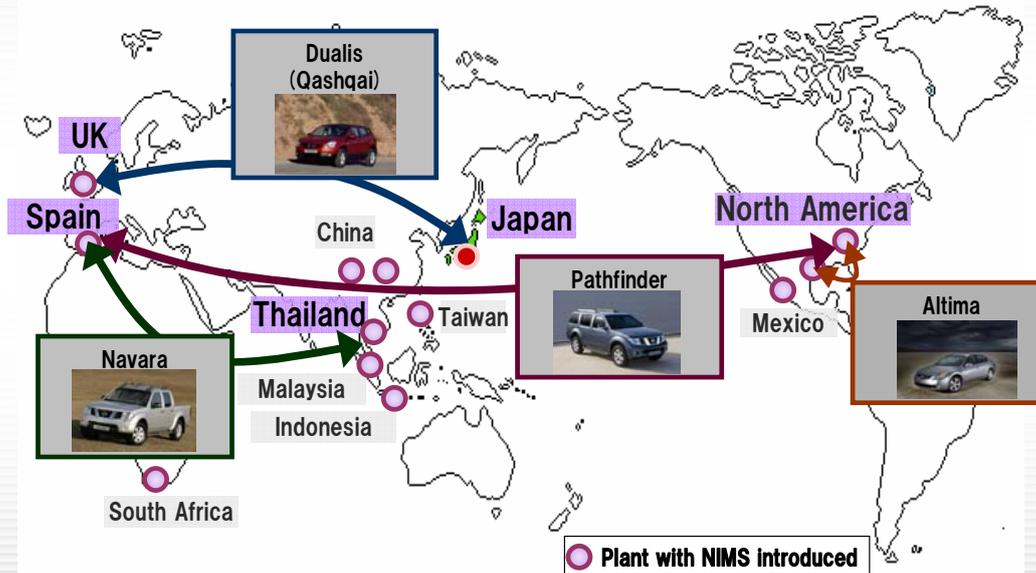
Globalization

Overview

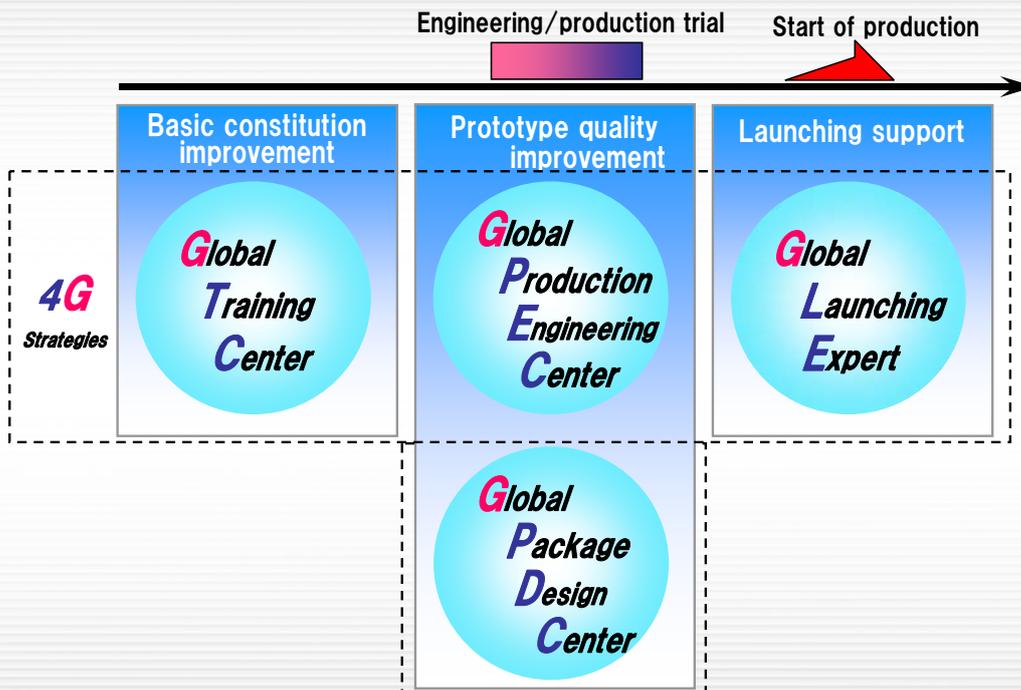


Standardization of hardware: Nissan Engineering Standard of NIMS (Nissan Integrated Manufacturing System)

Global vehicle production complement among plants/lines



Global production preparation activity



GTC (Global Training Center)

Early skill improvement with global master trainers

455 global master trainers (at the end of FY07)

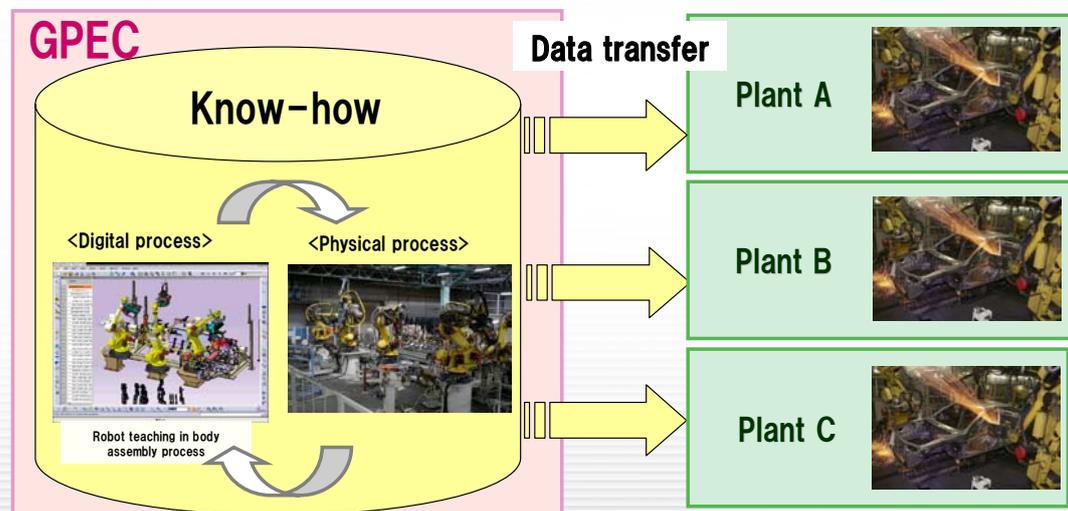


Communicate proper procedures and key points through visualized manuals (Japanese, English, Spanish, Thai, Chinese)

GPEC (Global Production Engineering Center)

Digitalized know-how (jigs/tools, inspection tools, controlling data, etc.) to be transferred to mass-production plant

Engineering trial Production trial Start of production



GPDC (Global Package Design Center)

Efficiency improvement by early study of packaging

Digital process Engineering/production trial Start of production

Digital packaging Physical confirmation

<ex. BMPR REINF ASSY>

Packaging volume per part
83% reduction

«Control indicator»
Design Standard Volume: Part volume * part pilling property
Design Standard Volume Ratio = "Actual packaging style"/DSV

Vibration test

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GLE (Global Launching Expert)

Diagnose and assess preparation status, and give practical support

Production trial Start of production

Capability diagnosis Trial, production preparation support Initial quality control support

Find problems Kaizen improvements Solve problems

847 of registrant (as of FY07)

Function

Site organization

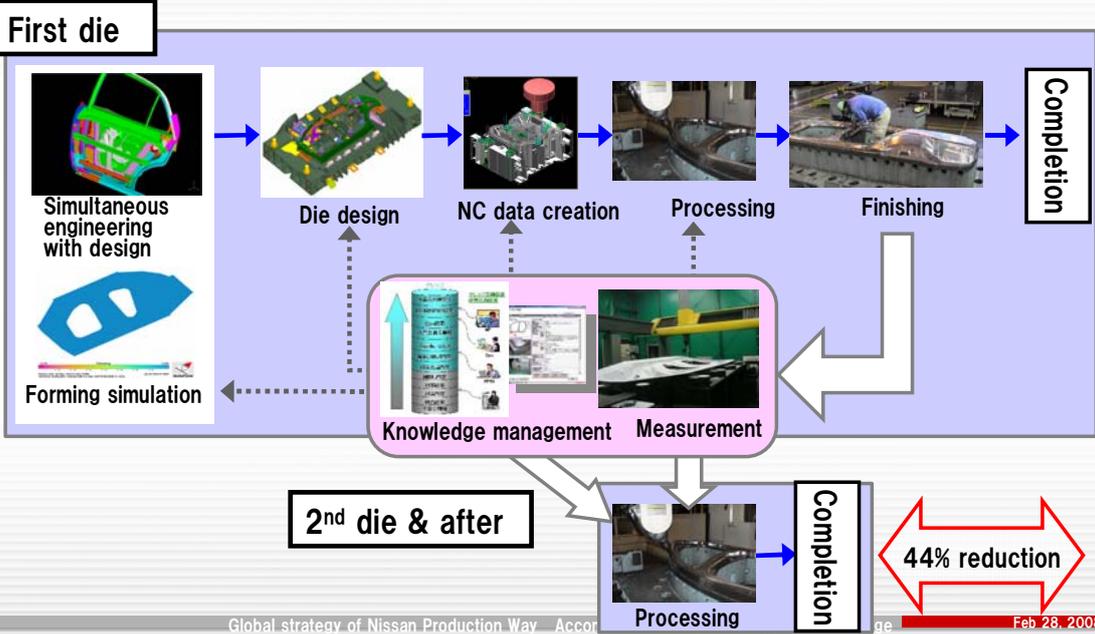
	Press	Body	Paint	Plastic	T&C	Final
Genba Kanri	○	○	○	○	○	○
Quality analysis	○	○	○	○	○	○
Quality variance	○	○	○	○	○	○
Vehicle QA	○	○	○	○	○	○
Part QA	○	○	○	○	○	○
Equipment reliability	○	○	○	○	○	○
SCM/logistics	○	○	○	○	○	○

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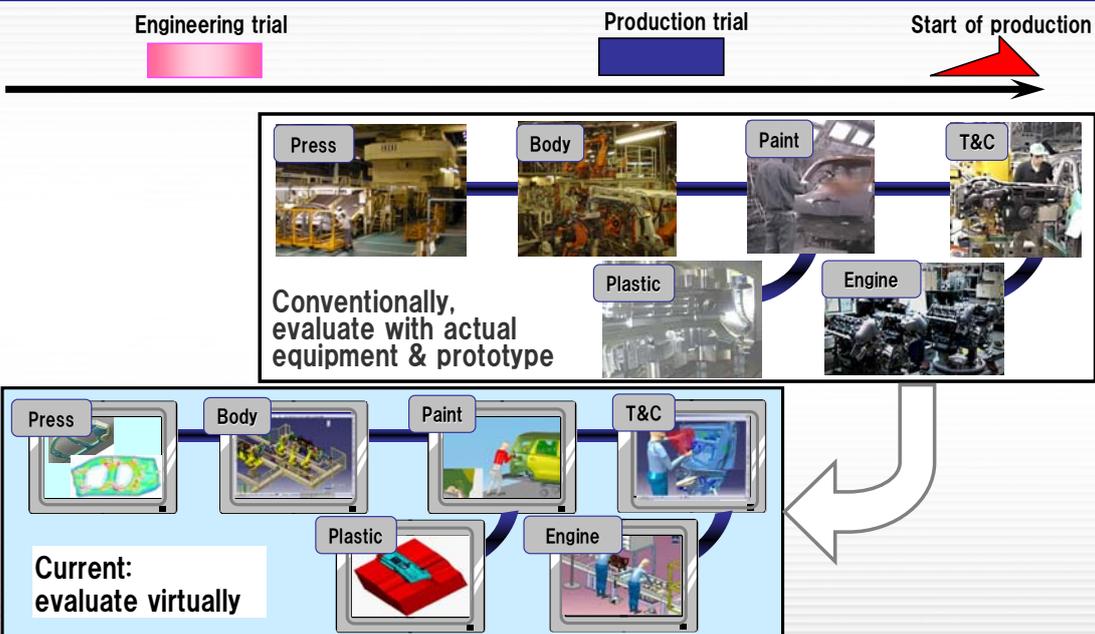
V3P (Value Up Innovation of Product, Process & Program)

Die manufacturing lead-time reduction by digitalizing know-how of craftsmanship



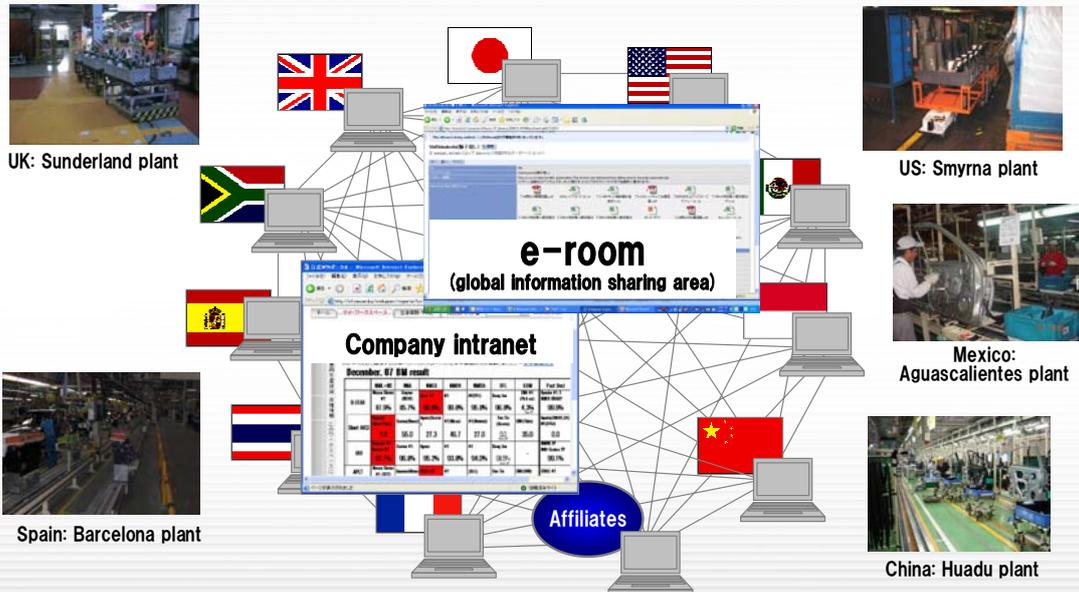
V3P

Study of early production start by utilizing digitalization



Information sharing through the intranet

Web-type global friendly competition



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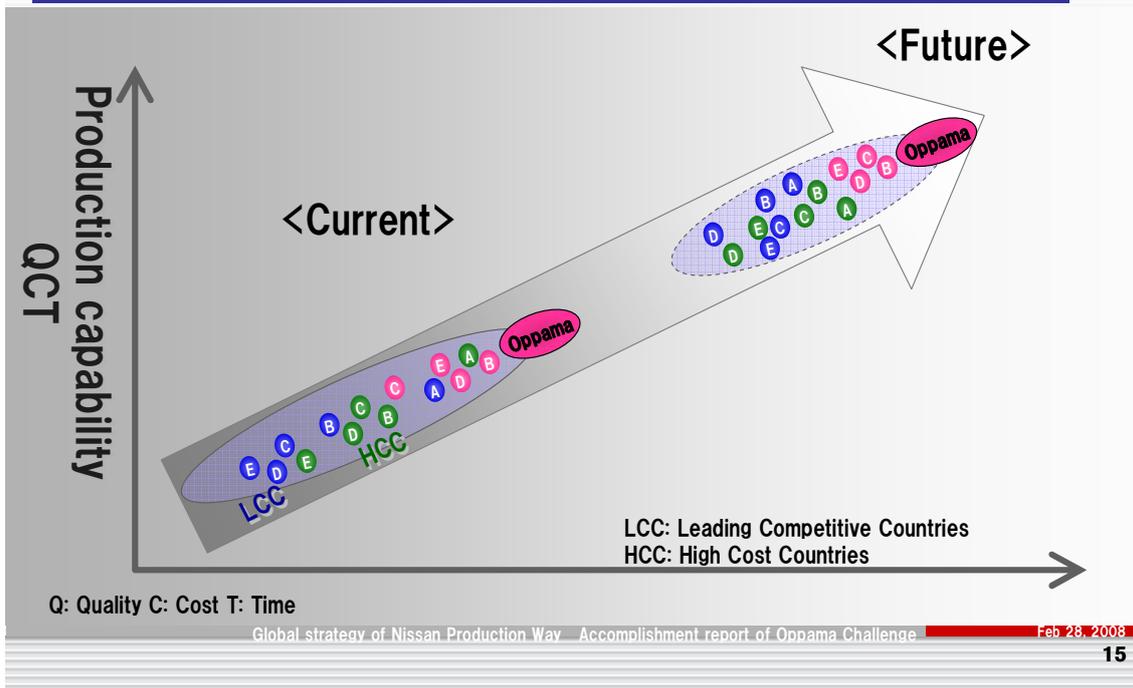
Global No.1 Challenge Activity

Utilize strengths of Japanese plants

Plant	Title	Aim
Oppama plant	Oppama Challenge	C: Cost challenge
Tochigi plant	Tochigi Plant Global No.1 Challenge	Q: Quality challenge
Kyushu plant	Kyushu Plant Challenge	T: <i>Douki-seisan</i> challenge
Yokohama plant	Yokohama Challenge	QCT 1/2 challenge
Iwaki plant	VQ Challenge	Challenge to high quality and the cost level of 4-cylinder engines

Japan takes the lead in *Monozukuri*

Oppama is the leader of “cost”.



Global strategy of Nissan Production Way

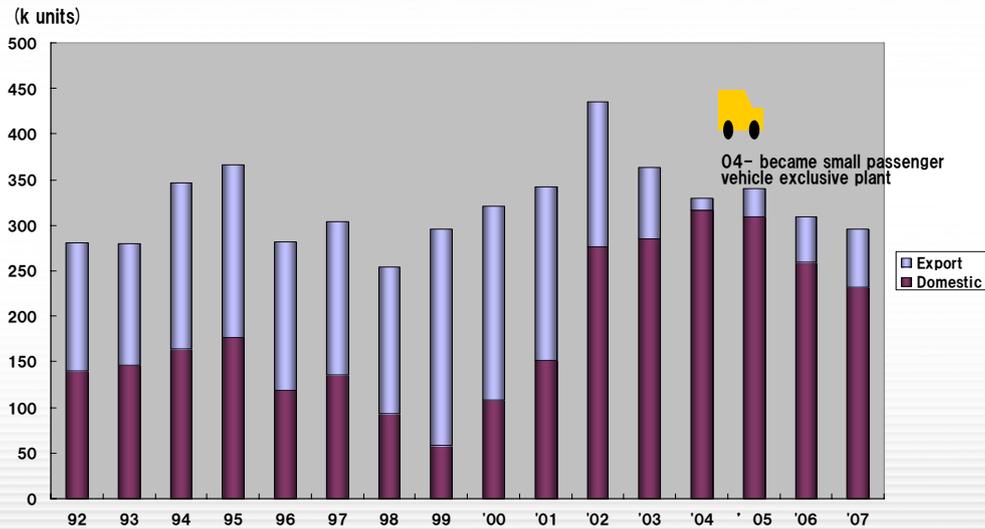
Oppama Challenge

- ✓ Accomplishment
- ✓ Activities

Background of Oppama Challenge

Need cost competitiveness for small passenger vehicle

<Production volume>



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Oppama Challenge is :

World's top *Monozukuri*

a **“survival strategy”** for the Oppama plant to regain production volume.

It aims to the world's top plant in quality, cost & time by quickly **“reforming *Monozukuri*”** through benchmarking with mini cars and LCC companies and strengthening collaboration between *genba* (manufacturing shop floor) and engineering.

Internal related departments and our partners (suppliers & logistics companies, etc.) cooperatively spearhead reformation and promote quick horizontal deployment to plants in and out of Japan.

Through this reformation, all questions about Japanese plant cost competitiveness should be cast aside. It will greatly contribute to Nissan to improve the level of *Monozukuri*.

With the **“world's top *Monozukuri*,”** global cars should be introduced so as to break away from a plant exclusive for the domestic market.

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Global strategy of Nissan Production Way

Oppama Challenge

✓ **Accomplishment**

✓ **Activities**

Accomplishment of Oppama Challenge

Summary

- ◆ **Improved cost competitiveness against LCC countries**
 - It was decided to introduce a next-generation model in the Oppama plant.
 - The utilization ratio of the Oppama plant improves.
(From Sept. '08, 2nd shift will start in the plant No.1.)

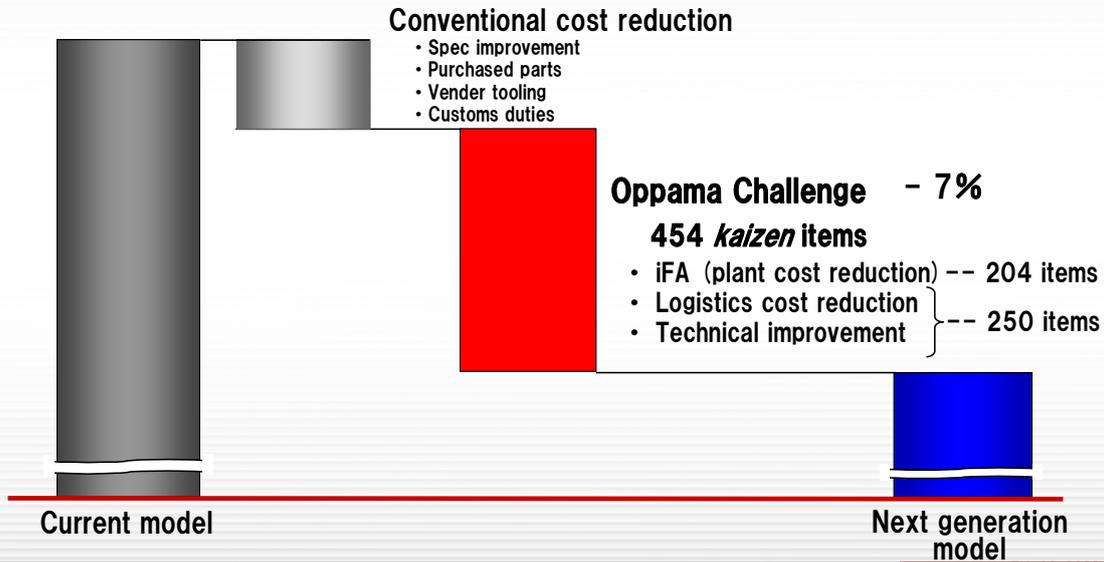
- ◆ **Globally expand iFA (iFA: cost reduction activities)**
 - To be applied globally; Russia, India, Morocco, etc.

iFA: integrated Factory Automation

Accomplishment of Oppama Challenge

7% of cost reduction from current vehicle

<Breakdown of cost reduction>



Accomplishment of Oppama Challenge

iFA improves return on investment by 57%

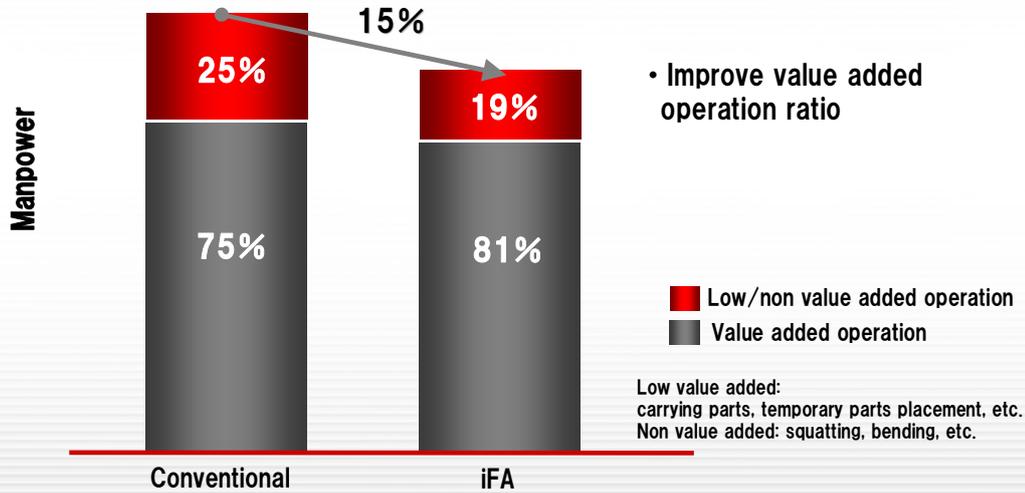
<Transition of return on investment>



Accomplishment of Oppama Challenge

iFA reduces manpower by 15%

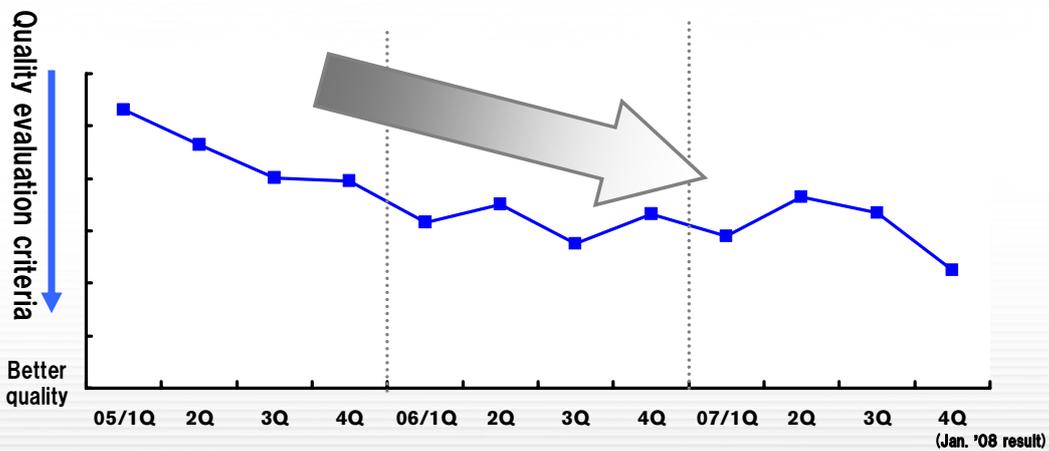
<Transition of manpower>



Accomplishment of Oppama Challenge

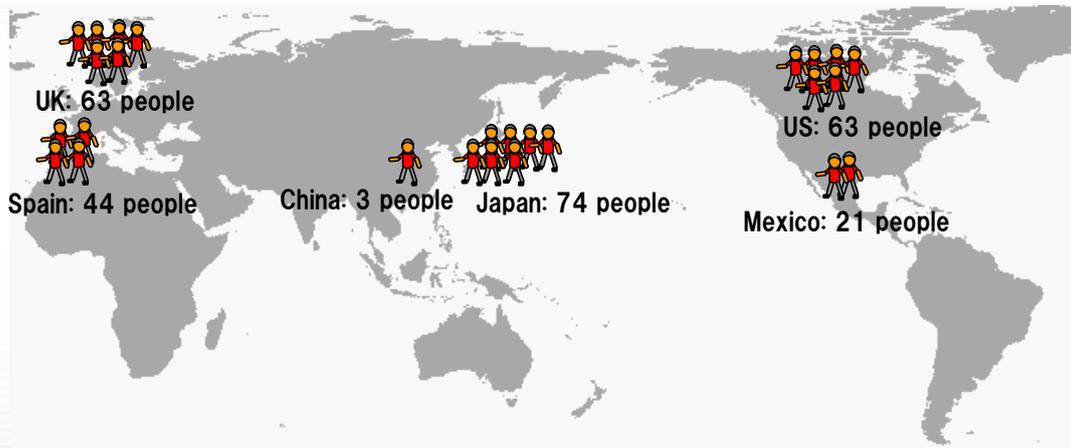
Further quality improvement

Awarded 1st prize in the domestic compact car segment for 3 years in a row by a third party organization.



Accomplishment of Oppama Challenge

Strengthen global organization for iFA (268 people)



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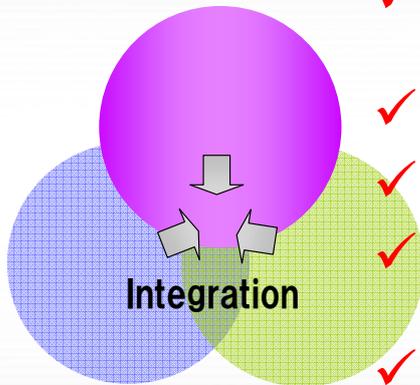
Oppama Challenge

✓ Accomplishment

✓ Activities

What is iFA?

Integrated Factory Automation



- ✓ Integration of manufacturing *genba* (shop floor) & logistics
- ✓ Integration of plant & supplier
- ✓ Integration of IT & *genba* (shop floor)
- ✓ Integration of IT & design/production preparation
- ✓ Integration of equipment preparation & production
- ✓ Integration of process

What is iFA?

Smooth material flow & low cost automation

Introduce low cost automation

**Karakuri* = automation with wisdom



Make material flow smooth without stagnation by looking into the flow

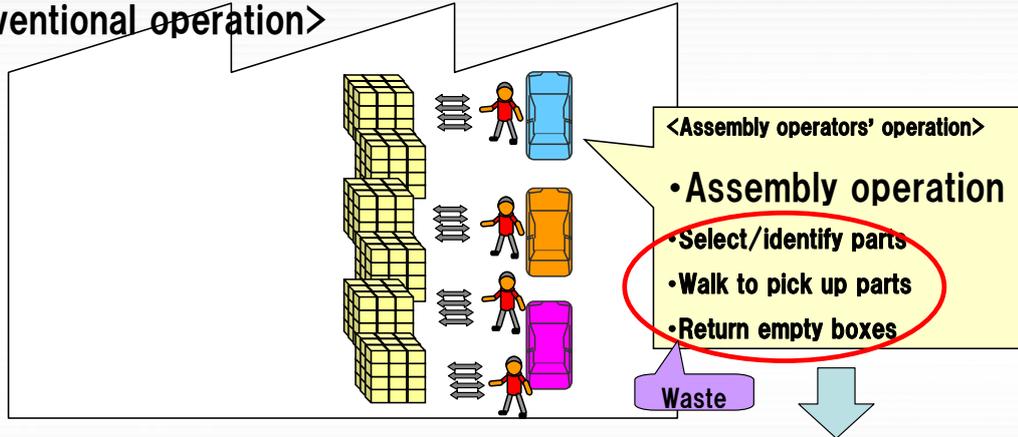
= Status with no waste

*What is *Karakuri*?

What is iFA? (Examples)

Smooth material flow

<Conventional operation>



Concentrate waste in assembly operation and make it obvious

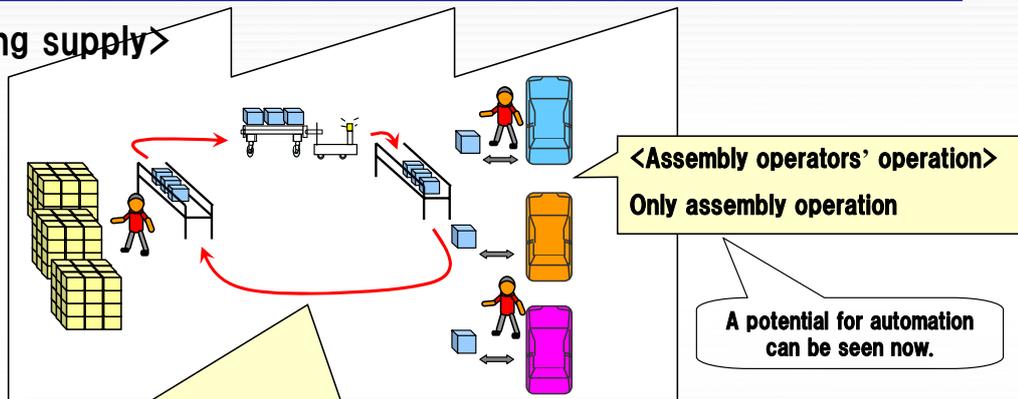
Need complex mechanism and high investment in automation

Look into material flow

What is iFA? (Examples)

Low cost automation

<Kitting supply>



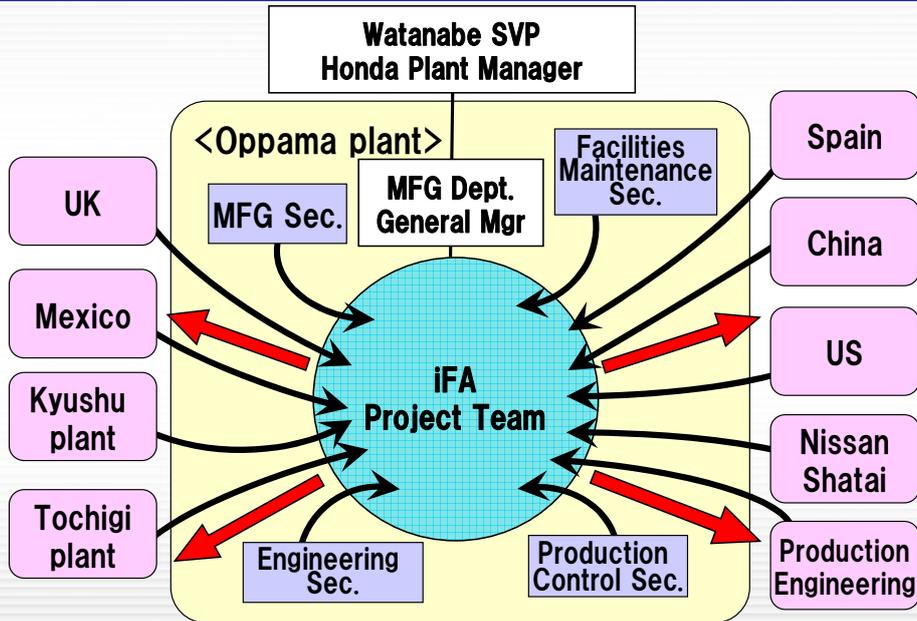
Single material flow (One flow line, one packaging style)

Realize "low cost automation"

- Introduction of AGV (automatic guided vehicle)
- Automatic box transfer device (*Karakuri*)

iFA promotion structure in Oppama Challenge

Members from each section and plant are concentrated.



Activities of Oppama Challenge

Total number of iFA *kaizen* improvement items is 204.

◆ Trim & Chassis shop



◆ Body assembly shop



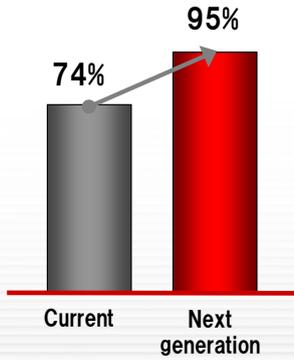
◆ Plastic molding shop



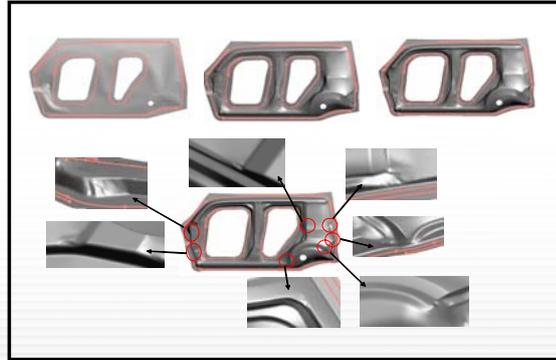
Activities of Oppama Challenge

Cost reduction by adopting general automobile steel

Transition of adopting in-house press parts



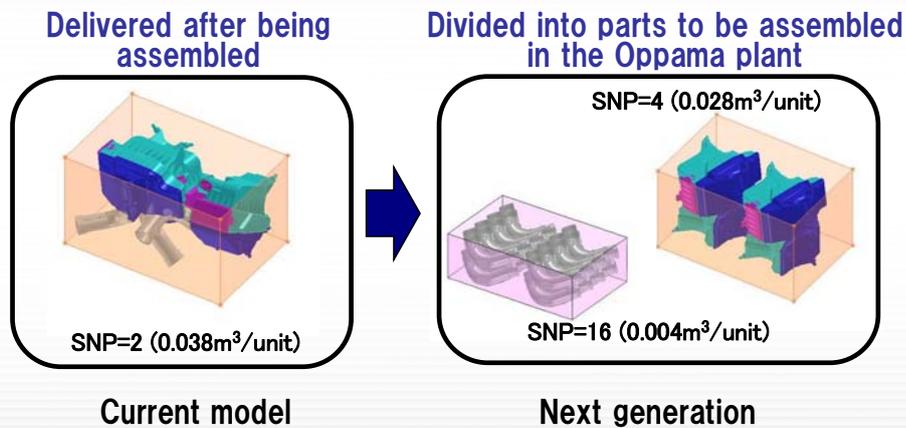
Study of corrugation through forming simulation



Activities of Oppama Challenge

Total cost (purchasing, in-bound logistics & in-house costs) reduction

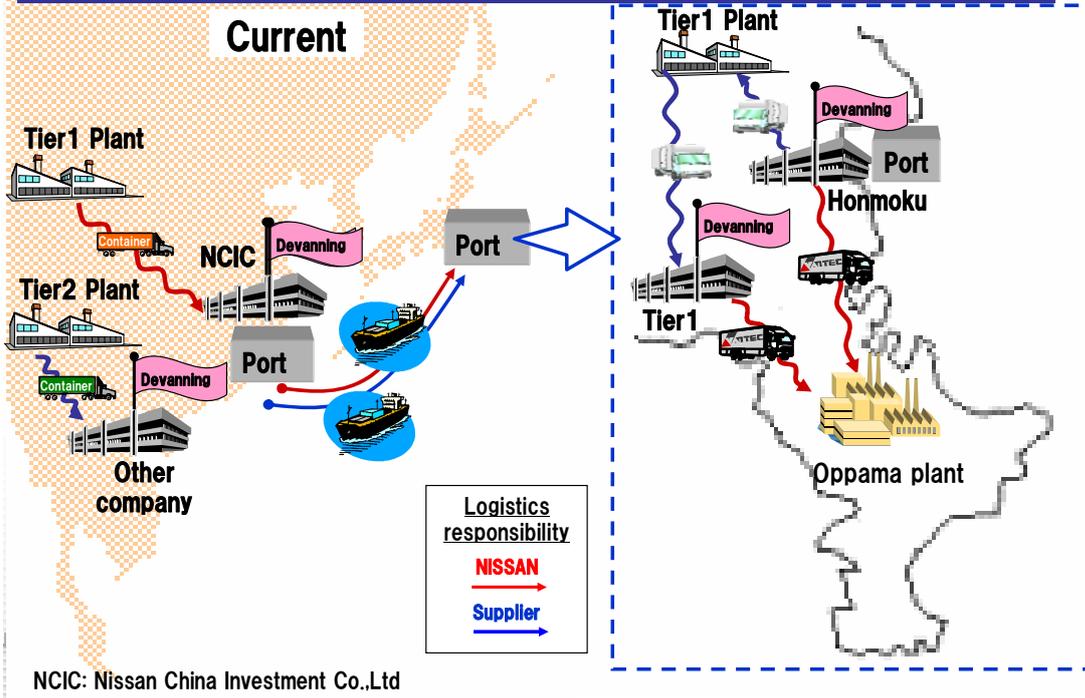
<Example of air cleaner>



SNP: Standard Number of Package

Activities of Oppama Challenge

Cost reduction by logistics sharing and direct delivery



Activities of Oppama Challenge

Cost reduction by logistics sharing and direct delivery

